

# The value of population campaigns offering free-of-charge HIV-testing: Observational study in a town in Cameroon

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## ABSTRACT

**Background:** HIV testing is encouraged, but in many countries testing is rarely free of charge except during campaign periods. **Aim:** To study experiences from four years of campaign week for HIV-testing in the town of Ngaoundere, Cameroon. Data have been collected and recorded from handwritten protocols in 2001, from pre- and post-counselling sheets in 2002, and from laboratory protocols in 2003-4. **Results:** Seropositivity tended to increase with increasing age, female sex, number of sex partners last five years and with low educational level. Different dimensions of knowledge about HIV was associated with less seropositivity. One of five persons tested never came back to know their result, but seropositivity in this group was not higher than for those who returned. Overall HIV prevalence during the last three years of campaign testing was 9.0%, a little higher than WHO national figures for Cameroon. **Conclusions:** HIV campaigns including testing may stimulate interest and knowledge about HIV, which is important to lower HIV incidence. The HIV vulnerability of females was confirmed. Campaigns did not easily attract less educated persons, and campaign testing prevalence therefore could be expected to be lower than HIV prevalence in the local population. On the other hand, people with high risk behaviour may be over-represented, increasing campaign testing prevalence. Most asymptomatic persons receiving a positive test did not come back for medical follow-up.

Scientific evidence of the efficacy of triple combination antiretroviral therapy exists since 1996, but treatment is expensive. General social security based access in rich countries, and paid access for rich people in poor countries, created an ethically as well as medically justified demand for highly active antiretroviral therapy (HAART) in poor countries. The difference in treatment possibilities is especially visible in Africa, which carries the main burden of the epidemic.

HAART was introduced in the region of Adamawa in Cameroon from 2001, as part of the National HIV/AIDS Program subsidised by the WHO and other international organisations. A day hospital unit was opened and a therapeutic committee was formed at the Provincial hospital, one of the two hospitals in the town of Ngaoundere with roughly 250 000 inhabitants. A medically led Technical group has from 2001 organised a week of voluntary, free-of-charge HIV testing around the international AIDS day 1 December. A systematic pre-counselling was given by trained health personnel, and the test results were given in a post-counselling session one week later. We wanted to study who came for testing, what they knew about HIV, how many came back for the results and who had a positive test. Based on the data we reflect upon

benefits and limitations of such testing in the fight against HIV.

## MATERIAL AND METHOD

The number of persons tested for each of the four consecutive years 2001-2004 was: 534, 866, 661 and 344, respectively. Because of problems with the testing procedures in 2001, the analyses presented here include data from the years 2002-2004 only. In 2002, the counselling sheets for 99 persons disappeared, and 767 of the total 866 persons were included for further analyses.

A first negative test was accepted as a final result. A positive result was always checked by a second test, and if not concordance, by a third test performed at a Centre Pasteur laboratory in the town of Garoua, 275 km away. From 2002, Determine® was used as a first test and Immuno-Comb® as the second test. The idea is to start with a highly sensitive test to have as few false negatives as possible, and confirm positive tests with a highly specific test to avoid false positives (1).

Data were recorded and analysed in SPSS (<http://www.SPSS.com/>). Chi square test was used for comparison between groups for categorical variables,

and t test for continuous variables. Logistic regression analyses were performed for assessing associations of HIV seropositivity with potential determinants. The final logistic regression model was determined based on analyses of bivariate associations between seropositivity and variables that could reasonably influence seropositivity, and on elimination of some variables not showing independent association in initial models.

Permission to transfer data from paper protocols and counselling forms to an anonymous data file was given by the provincial head of public health in Ngaoundere. A committee of ethics was in preparation at the provincial hospital but had not yet started functioning in 2002. The Regional Committee for Medical Research Ethics in Western Norway (REK III) was consulted about a HIV therapy project using routine clinical data to improve quality. Based on their judgement that this did not need approval of the Committee, no separate application was made for the current registrations.

## RESULTS

The prevalence of HIV-seropositivity was 9.0% among all persons attending the campaign testing during the years 2002-04. In 2002, females being tested had a mean age of 25.6 years (95% confidence interval 24.7–26.5), males 29.1 years (95% CI 28.2–30.0). Seropositive persons had a mean age of 30.0 years (95% CI 28.1–31.9), and seronegative persons 27.3 years (95% CI 26.6–28.0). For each sex separately, the difference is significant for males ( $P = 0.001$ ) but not for females.

Tables 1-3 show that seropositivity tended to increase with female sex, increasing age and number of sex partners, and with less schooling. The last finding is strengthened by an inverse relationship between knowledge about HIV and seropositivity in both females and males (table 2). The number of sex partners

reported the last five years was on average 2.5 for females (95% CI 2.2–2.8) and 4.9 for males (95% CI 4.3–5.4). Seropositive persons reported a mean number of 4.9 sex partners (95% CI 3.7–6.1) and seronegative persons 3.7 (95% CI 3.4–4.1). For each sex separately, this difference is significant for females ( $P = 0.009$ ) but not for males.

Females who came to voluntary testing had higher seropositivity than males throughout the years of campaign testing (table 1). If seropositive, females tended to have had an earlier sex debut than males ( $P = 0.027$ ) and females were more often unmarried than males ( $P = 0.008$ ). Males had more partners also for the seronegative group ( $P < 0.001$ ). Seronegative males had a new partner last 4 months more often than seronegative females ( $P = 0.001$ ) and tended to have had an earlier sex debut ( $P = 0.015$ ) and report regular condom use more often than seronegative females ( $P = 0.002$ ).

Males who are frequently on travel and females who sell sex are well known risk groups and are probably represented among males with mobile professions and unmarried females, especially those classified as unemployed (tables 1-2). Regular condom use was reported more frequently in seronegative than in seropositive persons although this relationship was not significant for each sex separately and in logistic regression models.

One of five persons tested never came back to know their result, but seropositivity in this group was not higher (table 1). There was no difference between age groups when it came to know the result. However, seropositive persons more often had kept to themselves that they had been tested (table 2).

One seronegative man was the only one who said he had had sex with men. One woman said she feared being seropositive because she knew her husband had had sex with men, and her test was positive.

**Table 1.** Seropositivity in relation to profession and communication of test results in HIV test campaigns during 2002-2004 for females (F) and males (M).

	2002						2003						2004						2002-04		
	F			M			F			M			F			M			Total		
	n	Sero-Positive %		n	Sero-Positive %		N	Sero-Positive %	n	Sero-Positive %		n	Sero-Positive %	n	Sero-Positive %		n	Sero-Positive %			
Profession																					
Local work	75	12	16	188	22	12															
Mobile work <sup>a</sup>	1	0	0	32	8	25															
Unemployed <sup>b</sup>	96	26	27	25	2	8															
Students/pupils	145	10	7	195	2	1															
Unknown	4																				
Came to know the result																					
Did come	245	35	14	362	26	7	231	25	11	335	17	5	127	15	12	147	6	4	1447	124	9
Did not come	76	13	17	84	9	11	36	5	14	60	3	5	51	6	12	27	1	4	334	37	11
All persons tested and recorded*	321	48	15	446	35	8	267	30	11	395	20	5	178	21	12	174	7	4	1781	161	9
Not recorded, not included in table	40	–		59	–														99	–	

<sup>a</sup> Truck drivers, soldiers, police

<sup>b</sup> Housewives, people looking for employment, retired persons

\* Relatively more females were seropositive, 2002:  $P = 0.002$ , 2003:  $P < 0.01$ , 2004:  $P < 0.02$

In addition to the December campaign testing, a separate campaign aimed at university and college students in February 2003 revealed only 10 cases of seropositivity among 310 students (table 4). During non-campaign periods, altogether 1665 tests in 2003 and 2828 tests in 2004 were performed at the day hospital at a subsidised price of approximately 1.5 USD paid by the patient. These tests were performed both in asymptomatic persons who wanted the test, and in persons referred by health personnel on the basis of consultations for symptoms. A high but unknown proportion was initiated on clinical grounds. Approximately 10-20% were performed free of charge in consenting asymptomatic pregnant women. The proportion of seropositive results was expectedly higher outside campaign periods ( $P < 0.001$  for both years). The proportion of persons who did not come back for their

results was also higher in non-campaign-tested persons (table 4).

From 2002, HIV positive persons were offered a contact with one of the hospital's few lay HIV positive volunteers immediately after the post-counselling by health personnel. This offer has been accepted in more than half of the cases, although we have no exact figures and no evaluation of the value of such talks. All seropositive persons also got an appointment with a medical doctor one to two weeks later, but only a small proportion, perhaps 10-20 per cent, have come back for these appointments with laboratory examinations and formal registration as an HIV patient. Again, we have no figures, but this seems different from people who test positively on clinical grounds. They usually come back to see their referring health professional, including a visit to the medical doctor.

**Table 2.** Characteristics of persons tested in 2002, in relation to seropositivity for females and males.\*

	Females (N = 321)			Males (N = 446)		
	Seropositive	%	P-value	Seropositive	%	P-value
Schooling			<0.001			
None	7	33		3	20	
1-9 years	16	28		8	12	
10+ years	23	11		22	7	
Marital status						<0.001
Married, monogamous	10	13		18	16	
Married, polygamous	6	24		4	17	
Not married	32	15		12	4	
Number of sex partners			0.004			0.010
0-1	12	9		2	3	
2-3	12	12		15	11	
4-9	16	29		9	6	
10+	2	29		7	15	
New partner last 4 months						
Yes	3	16		1	2	
No	11	6		4	2	
Age, sexual debut			0.003			
<16 years of age	21	30		6	6	
16-19	21	12		17	8	
20+	6	14		10	10	
Condom use**						
Regular	4	9		5	5	
Not regular or never	44	17		28	9	
Knowledge: cause of HIV			0.001			<0.001
Virus	13	9		9	4	
Other cause	29	23		21	14	
Can explain seropos. vs. aids			0.012			0.007
Can explain	19	11		14	5	
Cannot explain	25	21		17	13	
Confidence: Told about test			0.003			<0.001
To no one	6	43		8	20	
To someone	28	13		13	5	

\* Information available for 767 persons of the 876 tested.

\*\* Regular condom use was more frequent in seronegative than in seropositive persons ( $P=0.026$ ), but for each sex separately, this difference was not significant.

**Table 3.** Association between seropositivity and personal characteristics based on logistic regression analyses of data from 2002.\*

	Odds ratio**	95% CI
Age in years (continuous)	1.03	1.0–1.06
Sex (female=1, male=2)	2.1	1.5–2.7
Number of sex partners last 5 years (continuous)	1.07	1.0–1.1
Regular (=1) vs. not regular (=2) condom use	2.2	0.8–2.5
Schooling (None=1, 1–8 yrs=2, >8yrs=3)	1.4	1.2–1.7

\* 151 persons with incomplete data were excluded

\*\* OR > 1 for increasing age, female sex, increasing number of partners, and less schooling. For condom use, OR 2.2 for not regular use was not significant

From 2002, discordant tests and tests with uncertain results have become exceptional. However, in spite of a very good control system at the local laboratory, one positive result was communicated to a seronegative person who had got two numbers because waiting time had made her leave and come back for testing. It was discovered because the shocked young woman claimed she was a virgin. Subsequent double testing was negative and the error found. During the 2002 campaign, three lay HIV positive volunteers retested themselves and one was found to be negative. She had falsely tested positively three years earlier and had no money for a second, confirmatory test, which she considered superfluous because she had suspected being HIV positive.

## DISCUSSION

For the overall poor population in Ngaoundere and in most African countries in general, campaigns offering free-of-charge testing may be a good idea to promote knowledge about the HIV epidemic and to give people an opportunity to know their HIV status. Our study consistently confirms the important role of specific HIV knowledge as well as of education in general in preventing new cases of HIV. Pre- and post-counselling is well organised in Ngaoundere and may contribute to better information.

A large proportion of the population still have no or little formal schooling. In a previous study in Ngaoundere with a relatively high population representa-

tivity, it was found that half of all women in fertile age had no schooling at all, not counting choranic schools in this mixed Moslem-Christian population (2). In the HIV context, it tells that this is a vulnerable population where information and local initiative are important. The upstart of “the therapeutic era” should not be underestimated for what it gives in terms of hope and increased interest (3,4), however difficult it is to integrate long-term treatment in a culture with a weak and often failing health structure (5). These cultural and structural difficulties are illustrated in the study by the high number of people not coming back for their results, and by the high number of newly diagnosed but mostly healthy-feeling HIV positive persons who do not come to their scheduled consultation with a medical doctor. Campaign testing more than clinically based testing increases the group of people who know they are seropositive but who do not receive post-test counselling and medical follow-up that might reduce their probability of spreading the infection.

Lack of ability to pay is a problem in this population. Many persons coming for campaign testing say they would not have come during the year, when they have to pay a subsidised fee. Even if campaign testing is free of charge, the laboratory work-up and further follow-up for seropositive persons cost money, even if one omits the more expensive tests like viral load and some serological tests. CD4 is analysed locally and is less expensive. It is possible to follow patients through good clinical evaluations and a minimum of cheap blood tests, but doctors who are forced to practice in a very deprived and often lonely medical reality then receive little learning and stimulus to improve their clinical practice. In Ngaoundere, an economic analysis of the patient’s possibilities to pay during the next two to three years always accompanies the clinical evaluation when the therapeutic committee takes a decision about starting therapy. Dramatically lowered drug prices have helped a high number of people, but regular payment is still beyond the means of most individuals. Many receive help from their extended family and are thus accepted for therapy. It is not only a question of HIV drugs, but also of prophylactic and therapeutic medication against opportunistic infections. It is probably difficult for Western people to imagine to what extent ordinary people – including the minority who

**Table 4.** Seropositivity of HIV in data from campaigns and during clinically indicated testing in 2003–2004.

	2003						2004					
	Females			Males			Females			Males		
	n	Sero-positive	%	n	Sero-positive	%	n	Sero-positive	%	n	Sero-positive	%
December campaign for all	267	30	11	395	20	5	178	21	12	174	7	4
Student campaign, February	84	5	6	226	5	2	–	–	–	–	–	–
Regular testing rest of the year	961	206	21	745	151	20	1525	441	29	1303	262	20
Did not come for the result	101	17	17	108	13	12	182	39	21	112	18	16

are employed – are economically poor, and how it affects their daily life and their possibility to buy non-necessities (6).

As a group, the campaign tested persons are much better educated than the average population. The separate student campaign as well as the analysis of professions in the 2002 campaign shows that this particular group has relatively little seropositivity compared with other people being tested. It might thus seem probable that seropositivity in the adult population is higher than the 9.0% during the last three campaign years. WHO classifies Cameroon as a high burden country with an estimated HIV prevalence of 6.9% for the age group 15-49 years at the end of 2003 (7). A more recent survey in 2004 based on 11400 households has given a lower estimate of 5.5% for the whole country (Daniel Salpou, personal communication). Possibly the campaigns actually attract a segment of the population having some suspicion that they might be seropositive. The finding that relatively more seropositive persons had kept their testing for themselves may give some support to such a hypothesis. It is not unreasonable that more educated persons reflect more upon current public HIV information. This could explain that campaign seropositivity even in a better educated segment of the population could be higher than national figures based on surveys. National estimates used to be higher for the Adamawa province than for the rest of the country, and this is still so in the 2004 survey with a prevalence of 6.9% (Daniel Salpou, personal communication).

The HIV-prophylactic effect of condom use is well established. In the present study, a higher seropositivity for non-regular users is suggested but did not reach statistical significance in the logistic regression model (table 3). The effect may have been weakened in our study if people with more partners tend to be more regular condom users. Such a hypothesis is supported by a higher proportion of regular condom users among seronegative males than among seronegative females, and the higher number of sex partners the last 5 years for males. The importance of reducing the number of sex partners is confirmed in this study.

The higher seropositivity of females is very consistent and probably reflects more than a selection bias due to differential attendance at the campaign testing. The higher seropositivity in unmarried females and in females having had an early sex debut strengthens the impression of an HIV vulnerable female population, and females are also contaminated at a younger age. Female biological as well as social vulnerability for HIV is well known (8,9). Extreme examples of the

latter during the campaigns include one woman being tested after mass rape by soldiers in a war area in a neighbouring country, and a female university student reporting that she entertained a relationship to a married man because this was the only way she could pay for her studies.

Being HIV positive is clearly associated with great stigma, in this study suggested by a higher rate of seropositive people keeping the testing results for themselves. There are few voluntary counsellors in the local group of HIV positive people, but those who participate in the education of the population and in support of fellow HIV positive persons may have a significant impact on relieving the stigma (10).

## CONCLUSION

HIV campaigns including testing may stimulate interest and knowledge about HIV, which is important to lower HIV incidence. Campaigns have problems in attracting less educated persons, and most asymptomatic persons receiving a positive test result did not come back for medical follow-up. The HIV vulnerability of females was confirmed. Our results indicate that all programmes for HIV-testing and necessary follow-up should be publicly paid.

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